

**REMARKS**

Favorable reconsideration and allowance of the subject application are respectfully requested. Claims 1-12 are pending in the present application, with claim 1, 7, 11, and 12 being independent. Claim 12 has been added by this amendment, which does not add any new subject matter.

***Allowable Subject Matter***

Applicants note with appreciation the Examiner's indication on page 2 of the Office Action that claim 11 is allowable over the prior art of record, and that claim 6 would be allowable if rewritten in independent form including all the limitations of the base claim and any intervening claims. For at least the reasons detailed below, Applicants respectfully submit that all pending claims should be considered allowable.

***Specification***

In item 1 on page 2 of the outstanding Office Action, the Examiner states that the abstract should be in narrative form and should avoid using phrases such as this "disclosure concerns."

Applicants respectfully submit that the abstract does not contain such phraseology and is also less than 150 words. As such, Applicants respectfully request that the Examiner acknowledge that

the specification is not objected to in, for example, item 9 of the Office Action Summary Sheet.

Furthermore, Applicants respectfully request that the Examiner indicate whether or not the drawings submitted on October 19, 2000, are accepted by the Examiner.

***Claim Rejections Under 35 U.S.C. §103***

The Examiner rejected: claims 1, 2, 3, 7, and 10 under 35 U.S.C. §103 as being unpatentable over *Kanevsky et al.* (US 6,236,968) in view of *Byrnes et al.* (US 6,400,310); and claims 4, 5, 8, and 9 under 35 U.S.C. §103(a) as being unpatentable over the combination of *Kanevsky et al.* in view of *Byrnes et al.*, and further in view of *Sakamoto et al.* (US 5,404,422). These rejections are respectfully traversed insofar as they pertain to the present application.

Independent claim 1 is directed to an apparatus for detecting fatigue and doze by voice, comprising a controller capable of performing the following operations: calculating Lyapunov exponents by chaos analysis of digital data of voices; and judging a fatigue level and/or a dozing state by comparing the calculated Lyapunov exponents of voices uttered at different points of time.

*Kanevsky et al.* is directed to an automatic dialog system that keeps the driver awake while driving during a long trip. The system of *Kanevsky et al.* carries on a conversation with a driver on various topics and includes an automatic speech recognition module, a speech generation module, and a natural language processing module.

*Byrnes et al.* is directed to a high-resolution spectral estimator filter that is coupled to a spectral plotter and processes either Doppler frequencies provided from the output of a pulse-Doppler radar or a frequency based output provided by a Fourier transformer coupled to a sensing device to allow the spectral plotter to determine the power of a frequency spectrum of either the pulse-Doppler radar output or sensing device output.

In the outstanding Office Action, the Examiner acknowledges that *Kanevsky* "does not explicitly teach using Lyapunov exponents in a chaos analysis of the voice data," however, the Examiner cites *Byrnes et al.* for support thereof, specifically, column 17, lines 15-20, and column 18, line 20 to column 21, line 54.

Applicants respectfully submit, however, that the cited art fails to teach or suggest at least that a fatigue level and/or a dozing state is judged by comparing the calculated Lyapunov exponents of voices uttered at different points of time, as recited in independent claims 1 and 7. As such, the Examiner failed to

substantiate a *prima facie* case of obviousness.

In order to establish a *prima facie* case of obviousness, three basic criteria must be met: 1) There must be some suggestion of motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art to modify the reference or to combine reference teachings; 2) there must be a reasonable expectation of success; and 3) the prior art reference must teach or suggest all the claim limitations, see *In Re Vaeck*, 947 F 2d48, 20 USPQ2d 1438 (Fed.Circ. 1991).

Furthermore, Applicants note that one skilled in the art would not look towards Kanevsky et al. in order to teach the features of the present invention. Kanevsky et al. processes an uttered voice by the driver, whereby the uttered voice must have meanings that are understandable in order for the natural language processing module to analyze a driver's answer and the contents of the uttered answer, whereas the present invention is able to calculate Lyapunov exponents on a voice that is uttered by a person universally, e.g., the uttered voice does not need to have meanings that are understandable to not only other persons but also to the person who uttered the voice. In other words, it is not necessary for the uttered voice to be specified as a type of language.

Accordingly, as stated above, because the cited references fail to teach or suggest that a fatigue level and/or dozing state

is judged by comparing the calculated level of Lyapunov exponents of voices uttered at different points of time, Applicants respectfully request that the Examiner withdraw the rejection.

Dependent claims 2-6 and 8-10 should be considered allowable at least for depending from an allowable base claim.

New independent claim 12 should be considered allowable at least because the cited art fails to teach or suggest the combination of elements including judging a fatigue level and/or a dozing state by comparing the calculated level of Lyapunov exponents of voices uttered at different points of time.

### **Conclusion**

In view of the above amendments and remarks, this application appears to be in condition for allowance and the Examiner is, therefore, requested to reexamine the application and pass the claims to issue.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Martin Geissler (Reg. 51,011) at telephone number (703) 205-8000, which is located in the Washington, DC area.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees

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required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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Attachments